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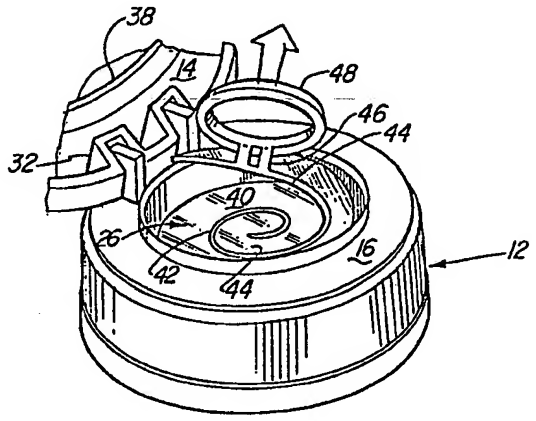
None

(58) Field of search
B8T
Selected US specifications from IPC sub-class B65D

(54) Tamper indicating dispensing closure

(57) A dispensing closure comprises a base cap (12) with a top (16) containing a dispensing orifice (26) sealed with an integrally moulded removable disc (40) having a spiral weakening groove (42) which defines a tear strip (44). Lifting a pull ring (48) attached to the tear strip removes the sealing disc as a spiral strip so that any attempt to hide a previous partial opening by pushing the lifted portion of the strip back in the plane of the disc will be easily detected. A lid (14) attached to the base cap provides easy access to the seal for detecting tampering as well as acting to close the orifice (26) after removal of the sealing disc.

Fig-2



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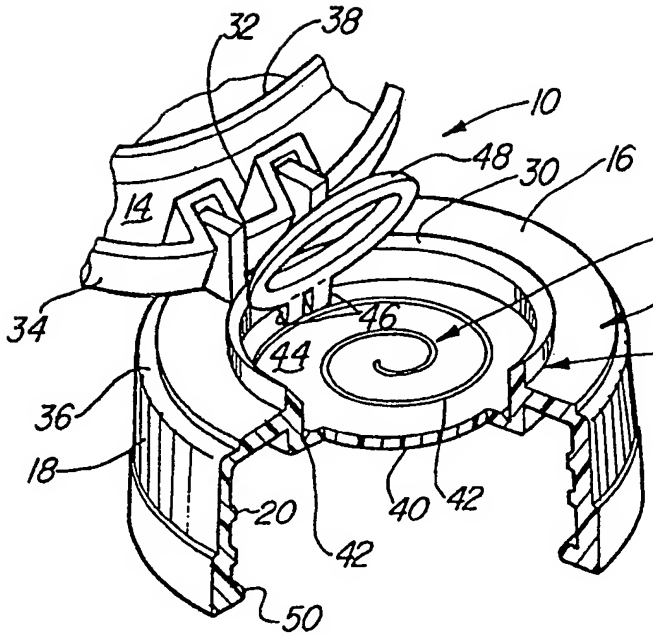


Fig-1

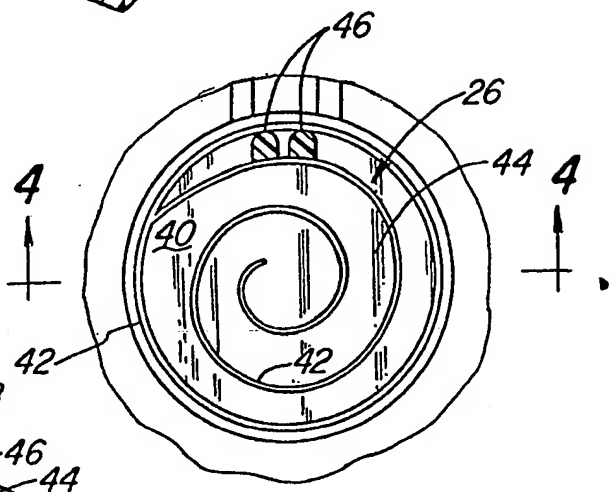
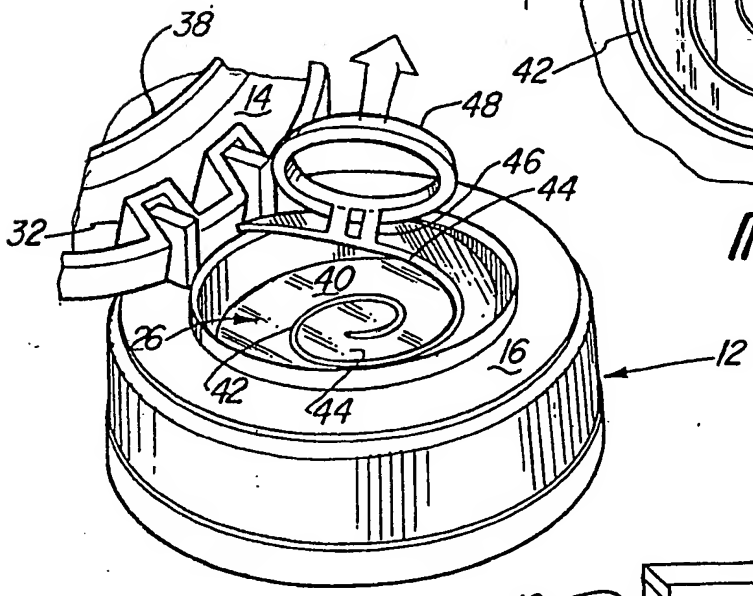


Fig-3

Fig-2



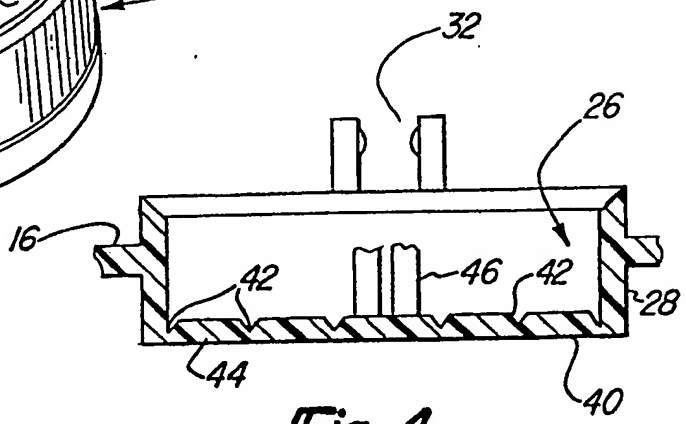


Fig-4

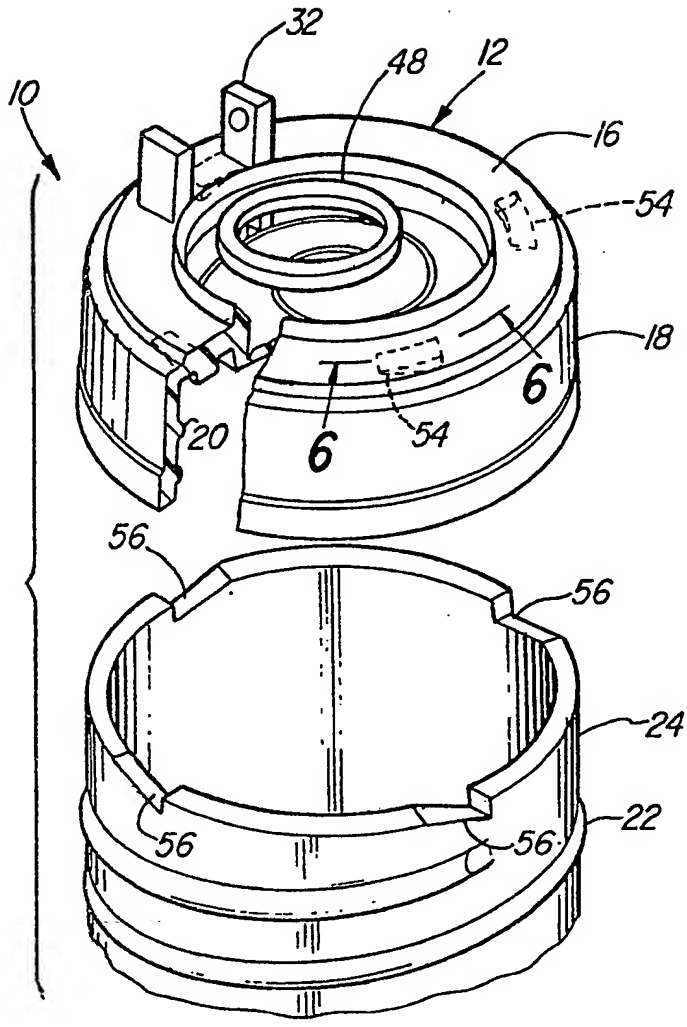


Fig-5

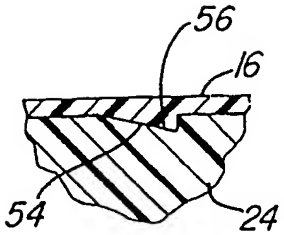


Fig-6

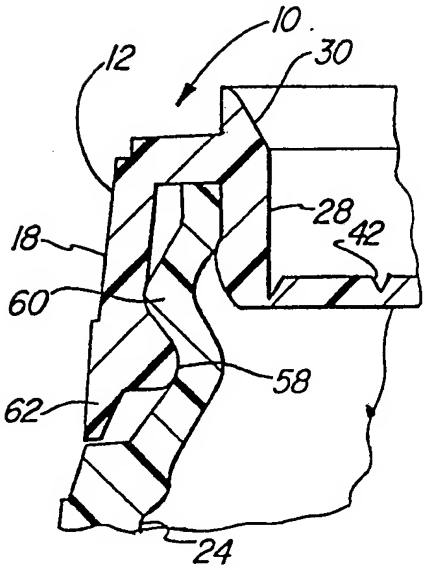


Fig- 7

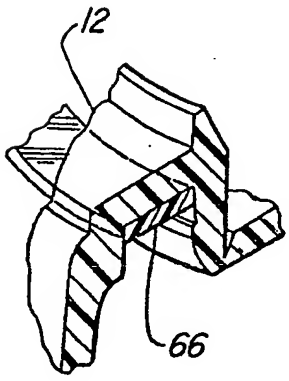


Fig-9

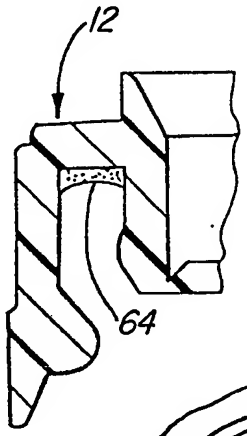


Fig-8

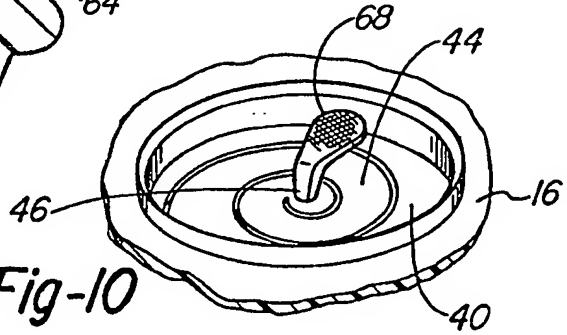


Fig-10

SPECIFICATION

Tamper indicating dispensing closure

This invention relates to a dispensing closure, and, more particularly, to a tamper indicating dispensing closure which indicates to the observer that the container-closure package has not been opened or that it has been opened or tampered.

There are a wide variety of closures which indicate to a prospective purchaser by the condition of the package whether or not it has been opened or tampered. Often such indication results from the fracture of a component part when the closure cap is unthreaded or snapped off the container.

In the case of a dispensing closure, the cap is designed to be permanently attached to the container, or at least not easily removable, so that dispensing must take place through the orifice in the cap and not through the container opening by removal of the cap itself. One way to provide tamper indication is to place a seal member over the dispensing orifice which also serves the useful purpose of sealing the original container. It has been found that tampering of such a sealed container can occur and remain undetected where the person originally opening this seal is careful to pry the seal away from the cap orifice and to replace it in an undamaged state. In order to eliminate the possibility of lifting the entire sealing member, the present invention contemplates the use of a tearing diaphragm type of seal which has been used for a number of years in the canned soft drink field and in the convenience food area on wide mouth containers for nuts and various fancy food products. It is believed that even with the tearing type of diaphragm that this type of tampering and non-detection could occur even where the sealing member is formed integrally with the cap as a sealing disc which is removed by the upward movement of a sealing ring attached to the disc which breaks the disc along a preweakened line formed by a groove. This is particularly true where the preweakened line only extends around the periphery of the orifice so that the lifted portion of the disc seal can be pushed back into planar alignment with the portion of the sealing disc that is still attached to the cap. Even where an annular tear strip is provided to remove the sealing disc, as in some convenience food easy-opening packages, partial opening could be obscured by careful realignment of the lifted portion with the still-attached disc.

It is therefore the primary aim of this invention to provide a dispensing closure having a tamper indicating sealing diaphragm covering the dispensing orifice that will enable attempts to hide a previous tampering or opening to be more readily detectable.

According to the invention we provide a tamper indicating dispensing closure adapted for use with a container having a neck which has means for attachment to the closure, the closure comprising a base cap having a top which has a dispensing orifice and a depending cylindrical skirt having complementary means for attachment of the base cap to the container, a lid joined by a hinge to the base cap, the hinge enabling the lid to be swung from a closed position covering the orifice to an open position for dispensing the contents of the container through the orifice, and a removable sealing disc extending across the orifice below the lid in its closed position, a spiral weakening groove being provided in the face of the disc and extending from the periphery inwardly towards the centre of the orifice to define between adjacent turns of the spiral groove a tear strip, and a pull tab attached to the tear strip adjacent one end of the tear strip, the arrangement being such that the sealing disc can be removed as a spiral tear strip by gripping the pull tab and lifting it away from the container, and the initial integrity of the container can be checked by swinging open the lid and observing the condition or absence of the sealing disc.

Typically, the cap skirt will be internally threaded to engage complimentary threads on the container for initial attachment of the closure to the container. An inwardly projecting bead may be formed at the bottom of the skirt to co-act and co-operate with a flange on the neck of the container so that as the closure is threaded onto the container, the bead of the closure snaps over the flange of the container making removal difficult or impossible. Another method of providing rigid attachment of the closure to the container by a mechanical connection is to provide ratchet means on the top of the base cap and the top of the container neck which allows threading of the closure onto the container but prevents unthreading. Other techniques of chemically bonding or gluing the closure cap to the container can be used. Chemical bonding can be employed by supplying the cap with a coated metallic liner disc which is heat fused to both the cap and container after the container has been filled and the closure threaded onto the container. Adhesive substances such as a plastisol liner can be inserted in the base cap to provide a strong adhesion between the cap and the container. The base cap may also be firmly attached to the container without threads by co-operating snap beads on the container neck and the cap skirt with or without additional gluing or bonding.

Preferably the pull tab is constructed with a post member attached at one end to the tear strip and having a lifting tab or pull ring at the other end of the post. The pull tab may be provided at the peripherally inner or outer end of the spiral tear strips and is preferably formed integrally with the tear strip. The sealing disc is preferably formed integrally with the base cap, and may be provided at the base of an annular nozzle collar surrounding the dispensing aperture.

The lid may have a flange which engages and co-operates with a groove in the top of the cap to hold the lid in its closed position.

The presently preferred embodiments of the invention are illustrated by way of example only, in the accompanying drawing in which:

Figure 1 is a perspective view partially broken away to show a dispensing closure in accordance

with the invention, and the means for attaching it to a container;

Figure 2 is a perspective view of the closure of Figure 1 but with its pull tab having been lifted away from the top of the closure to begin the removal of its spiral tear strip;

Figure 3 is a plan view of the closure with the lid and the pull tab removed to show details of the sealing disc with its spiral groove and attachment posts;

Figure 4 is a sectional view taken along 4-4 of Figure 3 showing the spiral grooves forming the tear strip in the sealing disc;

Figure 5 is an exploded perspective view of another closure in accordance with the invention, but arranged to be attached to the container by threads and a ratchet device;

Figure 6 is a partial cross-sectional view taken along line 6-6 of Figure 5 showing the inner acting ratchet teeth;

Figure 7 is a partial elevational view in section of yet another closure cap attached to the container by the inner action of a cap bead and container flange;

Figure 8 is a partial elevational view of the closure of Figure 7 without the container but showing the use of a plastisol liner to rigidly attach the cap to the container;

Figure 9 is a fragmentary perspective view of a portion of the closure shown in Figures 7 and 8 showing the use of a metallic seal member for attaching the closure cap to the container; and

Figure 10 is a partial perspective view of the top of a further closure cap in accordance with the invention showing an alternative connection of the pull tab to the inside end of the spiral tear strip.

Referring to Figures 1 and 5, a closure 10 is shown as including two separable parts: a base cap 12 and a lid 14. The cap 12 is formed with a flat top 16 and a depending annular skirt 18 having internal threads 20 for engaging complementary threads 22 on a container neck 24 (Figure 5).

The top 16 of the cap has a central circular dispensing orifice 26 which is defined by a nozzle collar 28 projecting concentrically with cap skirt 18 above the top 16 to define a pouring lip 30.

Base cap 12 and lid 14 are formed with a separable dual post hinge structure 32 as shown and described in U.S. Patent Application, Serial No. 825,464 filed in the name of Bush for a TWO PIECE DISPENSING CLOSURE. The lid 14 is further provided with a depending annular skirt 34, the bottom of which engages a recess 36 in the top of base cap 12 when the lid is swung to its closed position. Additionally, lid 14 is provided with a depending flange or rim 38 which engages the inside or outside diameter of the nozzle collar 28 to seal off the area of the dispensing orifice 26 when the lid is in its closed position.

Moulded integrally with the cap 12 is a removable sealing disc 40 which is contiguous to the bottom of collar 28 to completely seal the dispensing orifice 26. A spiral weakening groove 42 is formed in the base of the disc extending around the collar 28 inwardly towards the centre of the orifice to define between adjacent turns off the spiral groove 42 a tear strip 44. Extending upwardly from the outer area of the disc 40 adjacent one end of the tear strip 44 is a pair of posts 46 which are attached to a finger grip or pull ring 48. When the user inserts a finger into the pull ring 48 and pulls upwardly or away from the cap 12, the tear strip will start to separate from the balance of the sealing disc 44 as shown in Figure 3. The sealing disc 40 will thus be removed as a continuous spiral strip 44, and any attempt to tamper or partially open the dispensing orifice will be easily detected. Once the spiral strip has been lifted free from the disc 40, it will be virtually impossible to hide this prior opening or tampering by pushing the strip back down into collar 28 in an attempt to align the strip with the plane of the disc. The convenience of an easily removed sealing disc has thus been adapted to provide a very reliable indication of tampering of the 'as packaged' product. The perspective customer needs only to swing the lid 14 open to ascertain that no damage and hence no tampering has taken place.

As shown in Figure 1, the cap skirt 18 is provided with an inwardly projecting bead 50 which co-operates with a flange (not shown) on the container neck as the closure 10 is threaded onto the container. The bead 50 snaps over the container flange to retain the closure on the container and prevent its removal.

An alternative method of assuring the retention of the closure 10 on the container neck is shown in Figures 5 and 6, where ratchet teeth 54 on the inside of cap top 16 are arranged to engage ratchet slots or recesses 56 on the top of the container neck 24. The teeth 54 will slide over the ratchet recesses 56 when the closure 10 is being threaded onto the container neck 24, but will be retained in the recesses 56 to prevent unthreading of the cap from the container.

An alternative method of firmly attaching the closure cap 10 to the container neck 24 is shown in Figure 7 where an inwardly projecting cap bead 58 is snapped over an outwardly protecting flange 60 on the container neck. This provides a permanent type of seal requiring a different type of capping machine to apply the closure to the container neck than the capping machine that would be used with the threaded closure shown in Figures 1 and 5. An extension 62 of the cap skirt 18 beyond the internal bead 58 prevents the use of a prying tool to remove the closure 10 from the container neck.

With any of the foregoing attachment means, or independently thereof, the closure can be glued or permanently bonded to the container neck. The use of a plastisol layer or insert 64 is shown applied to the inside of the cap 12 in Figure 8. The use of an annular metal foil 66 which has been coated on both sides so that it will bond with the cap 12 and container neck 24 when heated after packaging is completed is shown in Figure 9.

Figure 10 shows that the spiral tear strip 44 may be separated from the balance of the sealing disc 40 starting at the centre by the use of a single post 46 attached to a pull tab 68. The placement of the pull tab relative to one or the other ends of the tear strip will be governed by moulding considerations, and the configuration and depth of the spiral groove can be adjusted accordingly.

CLAIMS

1. A tamper indicating dispensing closure adapted for use with a container having a neck which has means for attachment to the closure, the closure comprising a base cap having a top which has a dispensing orifice and a depending cylindrical skirt having complementary means for attachment of the base cap to the container, a lid joined by a hinge to the base cap, the hinge enabling the lid to be swung from a closed position covering the orifice to an open position for dispensing the contents of the container through the orifice, and a removable sealing disc extending across the orifice below the lid in its closed position, a spiral weakening groove being provided in the face of the disc and extending from the periphery inwardly towards the centre of the orifice to define between adjacent turns of the spiral groove a tear strip, and a pull tab attached to the tear strip adjacent one end of the tear strip, the arrangement being such that the sealing disc can be removed as a spiral tear strip by gripping the pull tab and lifting it away from the container, and the initial packaged integrity of the container can be checked by swinging open the lid and observing the condition or absence of the sealing disc.

2. A dispensing closure according to claim 1 in which the pull tab is formed integrally with the tear strip.

3. A dispensing closure according to claim 1 or claim 2 in which the sealing disc is formed integrally with the base cap.

4. A dispensing closure according to any preceding claim in which the pull tab is formed as a post means, one end of which is attached to the tear strip and the other of which is attached to a finger grip.

5. A dispensing closure according to claim 4 in which the post means includes a pair of closely spaced posts attached at one of their ends to the tear strip, and the finger grip is in the form of a pull ring attached to the other end of the posts.

6. A dispensing closure according to claim 4 or claim 5 in which the post means is attached to the tear strip adjacent its outer end.

7. A dispensing closure according to claim 4 or claim 5 in which the post means is attached adjacent the inner end of the tear strip.

8. A dispensing closure according to any preceding claim in which the container neck is threaded and the skirt is formed with complementary threads for attachment of the closure to the container.

9. A dispensing closure according to claim 8 in which the container is further provided with stop means and the closure is provided with complementary stop means, the stop means co-operating to retain the closure on the container in its fully threaded-on position.

10. A dispensing closure according to claim 9 in which the container stop means includes an outwardly projecting flange on the container neck below the threads and the closure stop means includes an inwardly projecting bead at the bottom of the skirt which snaps over the container flange when the closure is threaded onto the container to retain the closure on the container.

11. A dispensing closure according to claim 9 in which the stop means include ratchet means formed on the top of the base cap and the top of the container neck which allows threading of the closure onto the container but prevents unthreading of the closure from the container.

12. A dispensing closure according to any one of claims 1 to 8 in which the container neck is formed with an outwardly projecting flange and the skirt is formed with an inwardly projecting bead which snaps over the container flange for attachment of the closure to the container.

13. A dispensing closure according to any preceding claim in which the attachment means include a flat lip on the container neck and a complementary annular surface on the closure, with an adhesive being applied between the flap lip and the annular surface.

14. A dispensing closure according to any one of claims 1 to 12 in which the container neck has a flat lip, and further comprises an annular metallic seal member disposed within the skirt and engaging the lip and the closure when the closure has been initially applied to the container by engagement of the attachment means, the seal member having a coating on one side of a material fusable with the container and a coating on the other side of a material fusable with the closure when the seal member is subjected to heat, the arrangement being such that the seal member may be fused to the closure and to the container to form a permanent connection between them.

15. A dispensing closure according to any preceding claim in which the dispensing orifice is surrounded by a nozzle collar and the sealing disc is moulded integrally with the nozzle collar and closes its lower end to completely seal the dispensing orifice.

16. A dispensing closure according to claim 15 in which the lid is provided with an annular flange which engages and co-operates with the collar to hold the lid in its closed position.

17. A dispensing closure substantially as herein described with reference to Figures 1 to 4 of the accompanying drawings.

18. A dispensing closure substantially as herein described with reference to Figures 5 and 6 of the accompanying drawings.

19. A dispensing closure substantially as herein described with reference to Figures 7 and 8 of the accompanying drawings.

20. A dispensing closure substantially as herein described with reference to Figure 9 of the accompanying drawing.

21. A dispensing closure substantially as herein described with reference to Figure 10 of the accompanying drawings.

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